

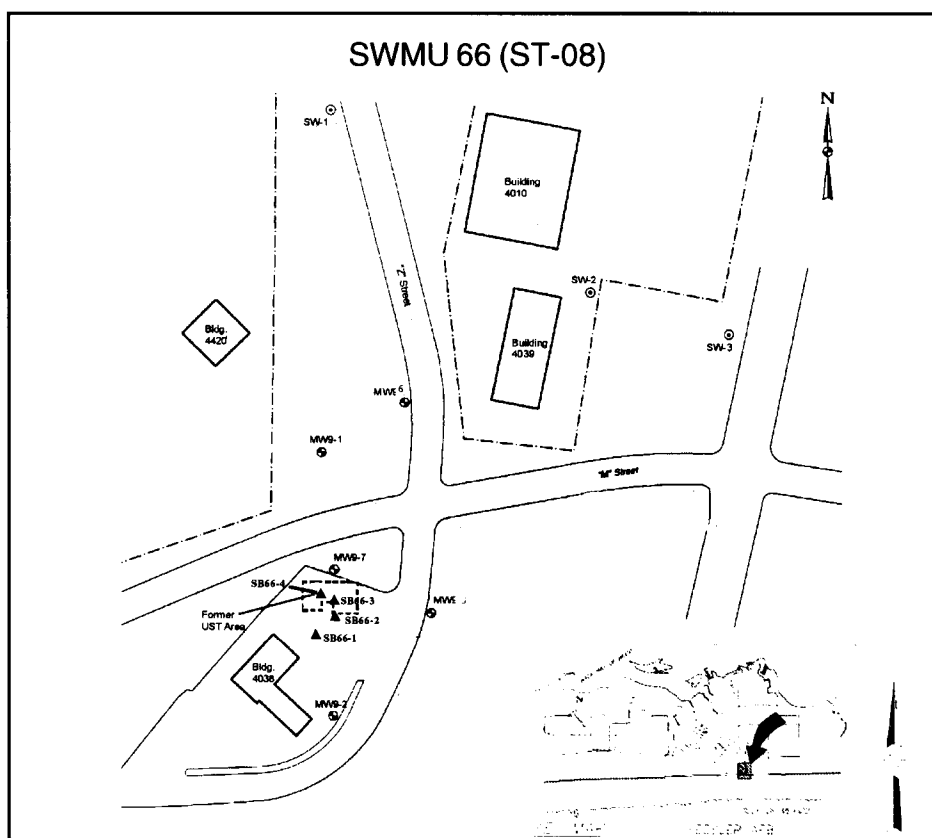


KEESLER AIR FORCE BASE INSTALLATION RESTORATION PROGRAM KEESLER AFB, MISSISSIPPI

Statement of Basis - Solid Waste Management Unit (SWMU) 66

IRP SITE DESIGNATION

Building 4038 Abandoned USTs: Resource Conservation Recovery Act (RCRA) Site Code: SWMU 66, Installation Restoration Program (IRP) Site Code: ST-08.



INTRODUCTION

Keesler Air Force Base (Keesler AFB) is located within the city limits of Biloxi, Mississippi, on the peninsula bordered by the Back Bay of Biloxi and the Mississippi Sound. The Building 4038 Abandoned Underground Storage Tank (UST) site is located in the southeastern portion of the Base along Z Street, approximately 60 feet northeast of Building 4038. SWMU 66 is the location of four

former USTs that contained gasoline and diesel fuel. One 8,000-gallon UST containing gasoline was taken out of service and removed in December 1987. This tank showed no signs of leaking and therefore, the source of fuel hydrocarbons detected in site soils and groundwater is believed to have been due to overfilling of the tank(s) or leakage from the underground piping system. The three remaining USTs (5,000-gallon gasoline, 8,000-gallon gasoline, and 8,000-gallon diesel tanks) were active until these tanks were

removed from service and excavated in November 1996. Tightness tests were performed on these three tanks in December 1992. The test results indicated that the tanks were structurally sound and not leaking any product.

This document, called a Statement of Basis, is part of the cleanup planning process and is a requirement of the RCRA permit issued by the United States Environmental Protection Agency (USEPA). The proposed remedy (cleanup method) is explained along with any other possible remedies that have been evaluated. Public comment and participation in the remedy selection process is requested.

The proposed remedy for SWMU 66 (ST-08) will consist of implementation of natural attenuation, long-term groundwater monitoring, and land use controls (LUCs) including groundwater use restrictions and land use restrictions.

The information presented in this Statement of Basis summarizes the information obtained from previous investigations conducted at SWMU 66 (ST-08). Detailed information concerning this SWMU can be found in the RCRA Facility Investigation (RFI)/Group 1 Sites Report (RFI Report, April 1999). This document will be available in the Administrative Record. The Administrative Record is located at the information repositories identified later in this Statement of Basis.

The public is encouraged to comment and participate in the remedy selection. The public is also encouraged to review the Administrative Record. The USEPA will select a final remedy for SWMU 66 (ST-08) only after the public comment period has ended, and the comments received are reviewed and considered.

PUBLIC COMMENT PERIOD AND PUBLIC MEETING

The public is encouraged to provide comments regarding the corrective action alternatives provided in the RFI Report (April 1999) and this Statement of Basis. In addition, the public may comment on any other corrective action alternatives, including those not previously evaluated. The public is also invited to provide comments on corrective action alternatives not presented in the above mentioned documents.

Important dates to remember

Public comment period begins:
January 13, 2000

Public comment period ends:
February 26, 2000

Please note, written comments must be postmarked no later than midnight, **February 26, 2000**. A public meeting will be held, if requested. During the public meeting, USEPA, the Mississippi Department of Environmental Quality (MDEQ), and the U.S. Air Force will be available to respond to oral comments and questions.

The Administrative Record for SWMU 66 (ST-08) is available at:

Biloxi Public Library
Reference Section
139 Lameuse Street
Biloxi, Mississippi
Mon., Tue., Wed., 9 A.M. to 8 P.M.
Thu., Fri., Sat., 9 A.M. to 5 P.M.

Comments received will be summarized and responses will be provided in the Responses to Comments document. The Responses to Comments document will be prepared following the close of the public comment period. The comments and corresponding responses, and the Responses to Comments will be included with the final permit modification in the Administrative Record.

To request further information please contact:

Ms. Lisa Noble
Keesler AFB, Mississippi
(228) 377-8255
lisa.noble@keesler.af.mil

or

Mr. Robert Pope
U.S. Environmental Protection Agency, Region IV
(404) 562-8506
pope.robert@epamail.epa.gov

or

Mr. Bob Merrill
Mississippi Department of Environmental Quality
(601) 961-5049
bob_merrill@deq.state.ms.us

Submit written comments to:

U.S. Environmental Protection Agency
Attention: Mr. Robert Pope
U.S. Environmental Protection Agency, Region 4
Federal Facilities Branch
61 Forsyth Street
Atlanta, GA 30303

Comments must be postmarked no later than
midnight, **February 26, 2000.**

PROPOSED REMEDY

The USEPA is proposing monitored natural attenuation, long-term groundwater monitoring, and LUCs including groundwater use restrictions and land use restrictions.

SWMU 66 (ST-08) DESCRIPTION

The Building 4038 Abandoned UST site is located in the southeastern portion of the Base along Z Street, approximately 60 feet northeast of Building 4038. SWMU 66 is the location of four former USTs that contained gasoline and diesel fuel. These tanks consisted of two 8,000-gallon gasoline tanks, one 8,000-gallon diesel tank, and one 5,000-gallon gasoline tank. One 8,000-gallon UST containing gasoline was taken out of service and removed in December 1987. This tank showed no signs of leaking and therefore the source of fuel hydrocarbons detected in site soils and groundwater is believed to have been due to overfilling of the tank(s) or leakage from the underground piping system. The three remaining USTs (5,000-gallon gasoline, 8,000-gallon gasoline, and 8,000-gallon diesel tanks) were active until these tanks were removed from service and excavated in November 1996. Tightness tests were performed on these three tanks in December 1992. The test results indicated that the tanks were structurally sound and not leaking any product.

SWMU 66 (ST-08) Investigations and History

As part of the RCRA Facility Assessment (RFA), one 8,000-gallon gasoline UST was removed from the site in December 1987. During the tank removal two soil samples were collected from the tank pit. As part of the RFA, a soil vapor survey was conducted in 1989 to investigate the presence of elevated concentrations of gasoline vapors in the soil. In addition, three groundwater monitoring wells (MW9-1 through MW9-3) were installed and

sampled to evaluate possible groundwater contamination.

Following the RFA, additional soil and groundwater data were collected as part of the RCRA Facility Investigation (RFI) beginning in 1992. Four soil borings and a temporary monitoring well were installed to evaluate the presence of soil and groundwater contamination at the site. Soil samples were collected continuously to a depth of 8 feet below land surface (bls) and screened in the field for volatile organics using an organic vapor analyzer (OVA).

Following the RFI, a treatability study was conducted to evaluate natural attenuation as a remedial alternative for the site. The treatability study included an organic tracer study, installation of five soil borings and three monitoring wells, installation of temporary piezometers for collection of groundwater samples, monitoring of electron acceptor and biodegradation byproduct concentrations, and modeling. Currently, monitoring wells sampled for groundwater contaminants include MW9-1, MW9-2 (upgradient of the site), MW9-6 through MW9-8, and SW-1 through SW-3. The groundwater flows in a northeastern direction.

SWMU 66 (ST-08) Investigation Results

Soil samples collected during the RFA were analyzed for total petroleum hydrocarbons (TPH), lead, and Extraction Procedure (EP) Toxicity. Analytical results indicated that TPH concentrations ranged from 743 to 4,770 mg/kg. Lead concentrations in soil ranged from 10.6 to 20.2 mg/kg. EP Toxicity results were below the established criteria for hazardous waste classification for toxicity characteristic. Soil vapor survey results detected elevated vapor concentrations in the soil and led to the installation of three groundwater monitoring wells. Groundwater analytical results showed the presence of TPH and lead, but no purgeable aromatic compounds (e.g., benzene, toluene, ethylbenzene, and total xylenes (BTEX)).

Four soil samples were collected from the soil borings installed during the RFI and analyzed for BTEX and TPH. The results from these samples indicated that the highest benzene concentration was 46.0 mg/kg, the highest ethylbenzene concentration was 50.0 mg/kg, the highest toluene concentration was 420 mg/kg, and the highest xylenes concentration was 370 mg/kg. The concentration of TPH ranged

from 42,000 to 19,000,000 mg/kg. Both the BTEX and TPH values were highest in boring SB66-4 which was the boring closest to the former tank pit.

In 1996, the remaining tanks were removed from the tank pit and replaced with aboveground tanks. Soils were excavated and taken to Keesler AFB's petroleum landfarm area. The soils that contained high TPH were treated at the landfarm.

Groundwater samples were collected during the RFI from the temporary well and the three wells installed during the RFA. Analytical results indicated that the temporary well contained BTEX and polynuclear aromatic hydrocarbons (PAHs). Only bis(2-ethylhexyl)phthalate was detected in two of the three wells installed during the RFA.

Soil samples collected during the treatability study indicated the presence of BTEX and PAH compounds in an area approximately 70 feet square at SWMU 66. Groundwater samples showed the presence of BTEX and PAHs, but no lead was found above the analytical detection limit. The treatability study results indicated that a vigorous natural attenuation process is currently underway at the site and that natural attenuation is a feasible alternative for remediation at the site.

SUMMARY OF SWMU 66 (ST-08)

RISKS

Soil and groundwater data from the RFA, RFI, and treatability study were used to evaluate human health risks associated with exposure to contaminants in the affected media (RFI Report, April 1999). Ecological risks were not evaluated at the site, since no complete exposure pathways exist.

For human health, USEPA Region 4 has established a target level below which derived cancer risks and non-cancer hazards are considered to be acceptable. Risks were evaluated for current industrial workers, hypothetical future industrial workers, hypothetical future construction workers, and hypothetical future residents (both adults and children) and compared to the USEPA Region 4 target levels. However, current workers were not quantitatively evaluated since no surface soil data was available.

In the future, excavation activities are assumed to result in subsurface soils being uncovered and brought to the surface, resulting in the subsurface soils becoming available for contact by future receptors. In addition, hypothetical future industrial workers and hypothetical future residents were expected to be exposed to groundwater.

Human Health COCs in soil and groundwater for future receptors at SWMU 66 were identified per USEPA Region 4 guidance [total scenario cancer risk greater than or equal to 1×10^{-4} (one in 10,000) and total scenario hazard index (non-cancer effects) greater than or equal to 1.0]. Benzene in groundwater and subsurface soil and bis(2-ethylhexyl)phthalate in groundwater were identified as COCs for both the hypothetical future residents and the industrial worker. In addition, 2-methylnaphthalene and naphthalene were identified as COCs for hypothetical future residents. Based on the ARAR comparison, benzene in groundwater and TPH in both groundwater and subsurface soil were identified as COCs to be remediated at SWMU 66.

Although COCs were identified for the hypothetical future resident, it should be noted that, given the current industrial use of the site and anticipated future use as an industrial area, it is highly unlikely that residential development will ever occur at SWMU 66. Although the hypothetical future resident is not expected to live at the site, this group was included in the risk assessment to allow a health-protective evaluation of the soil and groundwater at SWMU 66.

The majority of the risk derived for the receptors was associated with groundwater contact (drinking and bathing in water obtained from a hypothetical well located on the site). It should be noted that Keesler AFB currently obtains drinking water from a municipal source and it is not likely that any future group will obtain drinking water from a well drilled onsite. Exposure to groundwater beneath the site, therefore, is considered to be highly unlikely for any future receptor group.

The COCs identified from the human health risk assessment for the future industrial workers are presented in the following table along with their associated cancer and noncancer risk. The future industrial worker is the most probable future on-site receptor at SWMU 66.

Medium	COC (1)	Maximum Detected (2)	Federal MCL (3)	MS MCL (4)	Exposure Routes (5)	Cancer Risk (6)	HQ (non-cancer) (7)
Groundwater	Benzene	2×10^0	7×10^{-2}	5×10^{-3}	Ingestion/ Dermal	2×10^{-4}	8
	Bis(2-ethylhexyl)phthalate	3.7×10^{-3}	6×10^{-3}	6×10^{-3}	Ingestion	2×10^{-6}	0.02
	TPH	5×10^{-2}		1.8×10^{-1} (8)	Exceeds ARAR	ND	ND
Subsurface Soil TPH		1.9×10^{-7} (9)		1×10^{-2} (8)	Exceeds ARAR	ND	ND
<p>(1) Chemical of Concern</p> <p>(2) Maximum Detected Value. Units in mg/L (water) or mg/kg (soil).</p> <p>(3) Maximum Contaminant Level, EPA 1996. Units in mg/L.</p> <p>(4) Maximum Contaminant Level, MSDEQ 1991. Units in mg/L.</p> <p>(5) Pathways of exposure resulting in a chemical being identified as a COC.</p> <p>(6) Total risk = ingestion + dermal risk, where appropriate.</p> <p>(7) Total Hazard Quotient = ingestion + dermal HQ, where appropriate.</p> <p>(8) MSDEQ UST Regulations 1991. Units in mg/kg.</p> <p>(9) These sample results were from pre-Interim measures sampling.</p> <p>ND Not Derived given lack of appropriate toxicity values.</p>							

The uncertainty analysis in the RFI recommended that bis(2-ethylhexyl)phthalate be dropped from further consideration as a COC to be evaluated for potential remedial action. This decision was based on the magnitude of hazard/risk associated with exposure, the uncertainty of the quality of data, and the fact that it is not associated with past activities at the site.

The maximum detected concentrations (MDCs) of the COCs identified from the risk assessment and the ARAR comparison and recommended cleanup value are presented below for groundwater:

COC	MDC Groundwater (mg/l)	Recommended Cleanup Level (mg/l) (1)
Benzene	2	0.09
TPH	500	18

(1) - The recommended cleanup values are defined as the cleanup levels associated with carcinogenic (risk level = 1×10^{-5}) and noncarcinogenic (HQ = 1) effects in the future industrial worker or the MDEQ UST regulation.

In groundwater, the MDCs for benzene and TPH exceeded the cleanup criteria.

In subsurface soil, the ARAR of 100 mg/kg was exceeded by the MDC of 1.9×10^7 mg/kg.

An ecological characterization was performed to evaluate pathways for exposure of wildlife and vegetation to site contaminants (RCRA Facility Investigation (RFI)/Group 1 Sites Report, April 1999). The conceptual model indicated that there are no complete exposure pathways at this site. The site and surrounding area are developed; therefore, a baseline ecological risk assessment of the site was not conducted.

CORRECTIVE ACTION SCOPE

A bioventing interim measure was conducted at the site and was intended to evaluate this remedial process and to remediate hydrocarbons detected in site soils. The interim measure consisted of bioventing, which includes injecting air into the unsaturated zone through wells to stimulate the indigenous microorganisms into degrading residual petroleum hydrocarbons. The bioventing project was conducted for approximately two years (1993-1995) until the remaining USTs at SWMU 66 were removed and replaced with ASTs. At that point, the site was modeled and investigated to determine if natural attenuation processes were happening. The dissolved groundwater plume was delineated and modeled also. The results of these efforts indicated that natural attenuation was occurring and the dissolved plume was stable.

The Corrective Action proposed in this Statement of Basis is intended to be the only corrective action taken at SWMU 66 (ST-08). The corrective action includes monitored natural attenuation, long-term groundwater monitoring, and land use controls. Land use controls, which include restrictions on groundwater use and future development of the site, will also be implemented. This action poses no threat to human health or the environment based on current site conditions at SWMU 66 (ST-08). Annual reporting of the groundwater sampling results and site status are required as part of the remedy.

CURRENT ACTIVITIES AT SWMU 66 (ST-08)

Long-term groundwater monitoring is ongoing at the site. Monitoring for BTEX constituents and MTBE is currently being conducted annually; however, it was conducted quarterly the first year. Sampling reports for SWMU 66 (ST-03) will be available in the Administrative Record.

CORRECTIVE ACTION ALTERNATIVES SUMMARY

On the basis of media cleanup levels determined for the site, effectiveness of the remedial alternatives, and an engineering cost analysis, natural attenuation with land use controls was found to be the best-suited alternative for remediation of the site.

The HHRA for SWMU 66 (ST-08) identified groundwater and subsurface soil as media of concern for hypothetical future receptors. Therefore, the selected remedial alternative for this site should consist of natural attenuation, long-term groundwater monitoring, and land use controls (land use restrictions and groundwater use restrictions). Natural attenuation is expected to address TPH in subsurface soil and groundwater at the site. Monitoring of groundwater will provide a reliable confirmation of natural degradation of the contaminants or it can provide an early warning to detrimental changes in groundwater concentrations. Based on the ARAR comparison, benzene and TPH in groundwater were identified as COCs to be remediated at SWMU 66. The groundwater and land use restrictions would prevent future development of the site and also prevent the usage of site groundwater by potential human receptors. No other remedial alternatives will be considered for this site as the site is currently paved with asphalt and it is very unlikely that this site will be used for future residential or industrial purposes based on the existing Base infrastructure. These corrective action alternatives are the only alternatives considered for SWMU 66 because no individual Corrective Measures Study was completed for this site.